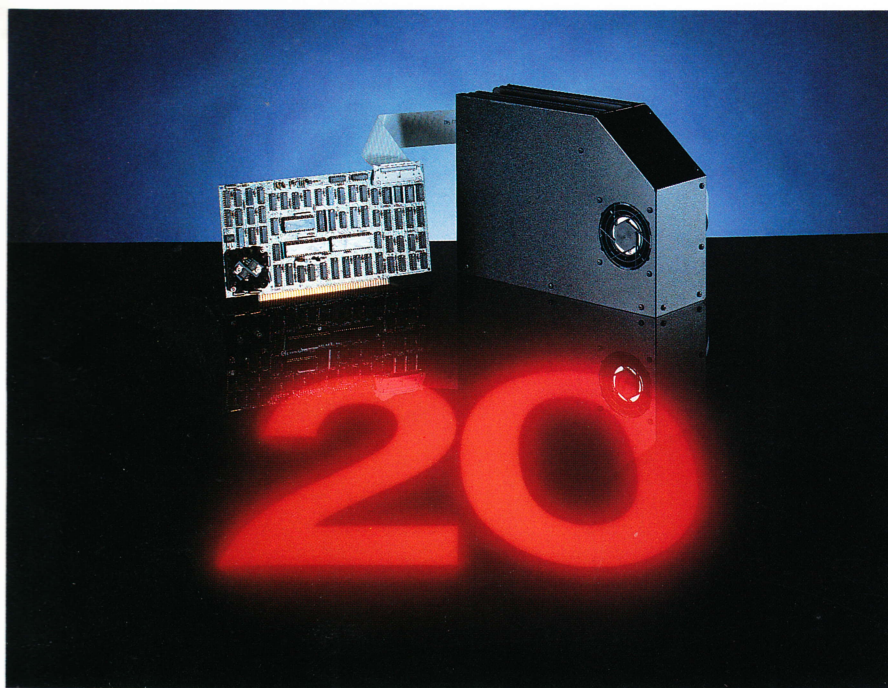


20 Megabyte Disk Now Available

Cromemco has announced a new 20-megabyte, 5-inch, Winchester disk drive for its computer systems. Cromemco systems that previously included an integral 5-megabyte disk drive will now include a 20-megabyte drive instead. Remarkably, Cromemco is providing this increased system capability with **no increase in system price**. The 20-mega-

byte drive, the 20-megabyte drive, and has a total of eight S-100 slots. The CS-2H has two 5" floppy disk drives, the 20-megabyte drive, and a total of 21 S-100 slots. The CS-3H has an 8" floppy disk drive (1.2-megabyte capacity), a 20-megabyte hard disk, and 21 S-100 slots.

The CS-2H replaces the Z2-H in the Cromemco product line. The CS-2H



byte drive is also available separately, for use with System Two or System Three computers, as model HD-20. The HD-20 (pictured below) replaces both the model HDD-11 and the HDD-22 in the Cromemco product line.

All three of Cromemco's systems are now available with the new 20-megabyte drive. The CS-1H includes one 5" floppy disk drive (390K

has the same external dimensions as the Z2-H. Yet the CS-2H has 20 megabytes of hard disk storage (as compared to 10 megabytes for the Z2-H) and 21 S-100 slots (as compared to 12 slots for the Z2-H). And the CS-2H is actually priced at \$1500 **less** than the Z2-H! The price of the CS-2H is just \$8495. The CS-1H lists for \$6995. The CS-3H lists for \$9495.

Continued on page 16

Direct I/O in "C" Using In-Line Assembly Code

by Jerome J. Tiemann, Ph.D.

One of the characteristics that distinguishes the S-100 microcomputer and its programs from the rest of the world of computers is the wealth of peripheral equipments that can be attached to them. In order to control these peripherals, it has been customary to provide high level languages for microcomputers with extensions (like PEEK, POKE, IN, and OUT), which permit the programmer to escape from the constraints of the language and get a job done that the language designers never dreamed of. This has made it possible to control telephone mo-

Continued on page 10

32K Structured BASIC Beats MBASIC 5.2 in Benchmark Test

by Charles E. Hamilton

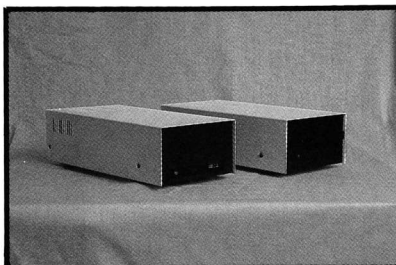
The January, 1983 issue of **Byte Magazine** had a feature entitled "Erathosthenes Revised" which dealt with various benchmarks for this prime number program. I ran the program on our Cromemco System Three under CDOS. Using Cromemco 32K Structured BASIC and following the rules of the authors, the time for the program was 1,380 seconds, or more than 1 1/2 minutes faster than MBASIC 5.2 for the same program. (A listing of the program in 32K BASIC follows.)

Continued on page 8

DISK DRIVE SUBSYSTEMS

THE SOLUTION TO DISK STORAGE PROBLEMS

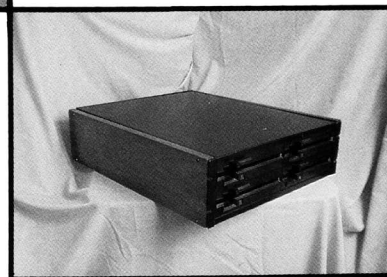
16 MB 5¼" Hard Disk



5¼" Stand-alone



**CDC Phoenix and
Lark Subsystems**
(not shown)



8" Subsystem Matches System One

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Disk Subsystems from the Butler-Griffith Group require **no hardware modifications**. Sixteen megabyte, five-inch subsystem for CROMIX*, stand-alone five-inch floppy systems, eight-inch drive subsystems to match the System One, and combination packs contain up to four, eight-inch slimline drives or, combined eight-inch drives and sixteen megabyte Winchester subsystems.

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FEATURES

All Floppy Disk Subsystems offer Double-sided, Double-density Storage. CDC Phoenix offers 96MB of storage. The 16MB Lark Drive has 8MB fixed and 8MB removable. The 96MB Subsystem has 16MB removable cartridges.

You choose the configuration best suited to your needs.

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Our interface card inside the cabinet assures compatibility with the Cromemco 16FDC.

Drive Manufacturers Represented . . .

Eight-inch drives from Mitsubishi Electric and Qume; half-eight (8" & 5¼") drives from Qume and Tandon.

Eight-Inch Drive Specifications

3 ms track-to-track

Average access time, including head settling time: 91ms

Transfer rate: 500KBPS

Formatted capacity: 1.2 megabytes

Recording method: FM single-density; MFM double-density

We also offer 10MB, 5¼" Winchesters for use with CROMIX systems.

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Unformatted capacity: 16 megabytes

Recording Surfaces: 3

Recording heads: 6

Rotational rate: 3600 rpm

Transfer rate: 5Mbits per second

Seek time: 125 milliseconds (average)

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I/O News

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Editor:

Users of 32K SBASIC may have a problem running under CROMIX 11.11. Output of a **running** SBASIC program cannot be halted with AS. The problem is in the new CDOS Simulator, sim.bin, which has been modified to run another company's software.

The following suggestion might help those who do not wish to rewrite programs to keep this useful feature.

First, keep both versions in the /bin directory, with the old version named oldsim.bin, and the new named

input...

newsim.bin. Now the user can copy either one into the real file sim.bin, which is the name CROMIX looks for when a .com program is called.

This can be done automatically by creating the following command file, named sb.cmd in the /cmd directory:

```
echo NOW loading CROMEMCO
32K Structured BASIC...
```

```
echo
```

```
mode -pa -ab
```

```
copy -f /bin/oldsim.bin
/bin/sim.bin
```

```
sbasic #1
```

```
copy -f /bin/newsim.bin
/bin/sim.bin
```

```
mode pa ab
```

Now, call SBASIC [program.name] with:

```
sb [program.name]
```

This command file first disables

the pause and abort-enable (Oc) of CROMIX, then copies oldsim.bin into sim.bin, then calls SBASIC and, optionally, an SBASIC program. Later, upon exit from SBASIC (usually with BYE), newsim.bin is copied into sim.bin, pause and abort-enable are restored, and everything is back to normal. If sbasic.com is in the /bin directory, and sb.cmd is in the /cmd directory, the user can access them from anywhere in the system.

On another subject, when a cold system is first turned on, many hard disks will fail to boot/read/write immediately. Users should ALWAYS allow a few minutes for the drive to warm up, and 30 minutes is even better. This applies to all hard disk systems, not just Cromemco. Also, even if it will boot and read, it still may not write properly, or detect a write error. On a cold morning, if I try to boot right after the disk comes up to speed, it will almost invariably produce:

```
disk home err: dev 2:0, blk-1,
cyl 00, surf 0, sec 0, stat 700
```

Now my system may be peculiar because I have a real hybrid, but this next problem seems to be in the 16FDC, WDI, or the drive, so other users might have experienced it, too. If I just turn the system on and let it sit for more than 20 or 30 minutes without attempting to use the hard disk (an old Corvus), there seems to be some sort of "time out" error generated by either the boards or the drive, and I will get the same error as above. I used to really get heart failure when the system would bomb cold, then I'd go do something else for an hour, come back, and the system would bomb due to the "time out". In this case, I discovered that a 30 second power-down resets the "timer", and the system will operate normally when the power is restored. Knowing the problem, I simply turn on the cold system, ATTEMPT a boot, then wait for warm up. Then if there was an error, a second attempt can be made, either by resetting the computer, or answering the two questions following the error message.

I feel that I/O News is worth the price, and I have found much useful info therein. However, I feel you omit too many "warts". Cromemco is a great outfit, I've been a user and a fan since early 1978, but there ARE bugs, problems, and disadvantages,

which I have rarely seen mentioned in your pages.

Very truly yours,
John R. Deakin
Member #00858
Roseville, CA

You are correct that we seldom mention bugs, especially those associated with hybrid systems, or other isolated causes. Meanwhile, rather than mention them, we often have been able to find the root causes and transmit the solutions directly to the user. This case is a perfect example of the peculiarities possible with hybrid systems which require ingenious solutions—such as yours. Ed.

Editor:

Since I am a new member of the IACU, my question may be an old one for you. I hope so! Because that will make for a less expensive solution to my problems.

I am a teacher who also does software development part time. An important fraction of that development time requires the use of a DEC (Digital Equipment Corp.) compatible terminal.

Such terminals (mine is a CIT-101) use ANSI Standard escape code sequences for control of the display in programs such as screen editors. I commonly use the KED keypad editor designed by DEC for use on their systems, via a modem and phone line to a PDP 11 computer.

But I also want to use the terminal with CDOS programs on my System Three here at home. This leaves me with the need for a resident hardware (or soft) translator to intercept all those escape sequences sent by various CDOS-compatible programs and diagnostics.

Please tell me it has been done already and is inexpensively available...or, publish this letter under INPUT to help me find help. HELP!

Yours truly,
M.W. St. Clair
Member #02070
1021 Sierra Drive
Menlo Park, CA 94025

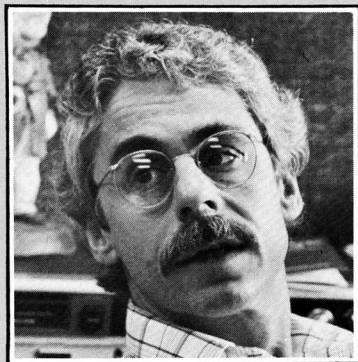
It's Time to Get Acquainted

There's a TV spot which features a Tarzan-like character who uses his Toyota to rescue people from the dangers they encounter in his jungle. When he comes home to the tree-house his dutiful mate asks him how his day went. His reply? "It's a



Kathleen T. Heckman

output



jungle out there."

Well, we face our own jungle. The jungle (or should I say jumble?) of confusion we encounter when we try to mate hardware and software is best exemplified by a joke Richard Quinn recently told me. It goes something like this. "How many programmers does it take to change a light-bulb?" The correct answer is, "None. That's a hardware problem."

What brings this subject to mind is a series of letters between one of our members, Professor B.R. Schneider, Jr., and Centronics Corporation, copies of which were forwarded to me. Professor Schneider's original reason for writing Centron-

ics was to find a source of formatting software (see bits & bytes... this issue) for the 737 printer. It seems that the good professor merely wants to have his printer right-justify under CP/M or CDOS. Certainly not an unreasonable expectation in a device that he describes as "...a most clever and elegant printer capable of doing anything I want—with one big catch!"

Except that nowhere in the various letters is it pointed out that this is usually a function of the word processing software. Instead, a Technical Support Specialist at Centronics points out that "...the Cromemco is a serious data processing computer and they do not get involved with word processing...."

Come on, Centronics! You've sold millions of dollars worth of printers to Cromemco. Your products have been in their catalogs for years. Don't you know your customers? Or, at least, your customer's products and capabilities?

I'm not trying to pick on Centronics. They really do make fine, reliable printers. Durable, too. What I am trying to point out is that there is still a tremendous lack of communications running rampant throughout this industry.

The Value of Education

With the complexity of even "simple" personal computers growing, as well as the number of users with zero prior computing experience, it seems that classes, seminars, and training are more in demand than ever before. Several of our members are turning their attention to this vital phase of the computing process.

Some examples of efforts in this area which have recently come to our notice are:

"An Introduction to Cromemco Computers: Hardware & Software," a manual written by Michael Merchant of MCM Enterprises in Palo Alto, California, and used in conjunction with MCM's regular training classes. Although we have not attended the classes, if the manual is a fair determinant of their quality, they must be just what is needed to become computer-competent in a very brief time span.

A more specialized training session is conducted by Bill Jaenicke of Newport Beach, California. Bill's one-day seminar on CROMIX offers the beginner all the insights and examples necessary to feel comfortable exploring the multi-level uses of this powerful operating system. His own experience with CROMIX began with pre-release copies almost three years ago, so his students derive the benefits of his untold hours of dedicated interaction with CROMIX.

Still in California, Richard Quinn of Quintec Systems, and Mike Peterson of Accountability Systems have regularly scheduled classes for their customers on everything from operating systems to applications software. And, Arnie Roberts of ADC Associates in Palo Alto (re-compilers of WordStar for Cromemco systems) seems to turn up in the seminar schedule at almost every major computer conference in the country.

Meanwhile, on the opposite coast, Jency and Jean Kelly of Royal Data, inc. of Titusville, Florida offer both one-on-one instruction and classes complete with overhead projections and terminals for hands-on applications. The Kellys feel that some training—however nominal—is part of the price of each system sold, and that knowledgeable customers are far better customers for long-term relationships.

And, Computer Center/Digibyte Systems Corp. with four locations in New York City has recently instituted regular C-10 classes and seminars in order to gear up for the tremendous numbers of brand new users.

Yes, the value of teaching is just now starting to find its niche in the industry as the public at large discovers it can no longer survive the rigors of the '80s without data handling helpers.

But, what else is going on? Who else is involved in writing books, manuals, or training guides? Let us know, so that we can spread the word and do our part in sharing knowledge, a most valuable commodity.

Richard Kaye
Editor

BOY, IS THIS COSTING YOU.

It's really quite basic: time is money.

And BASIC takes a lot more time and costs a lot more money than it should every time you write a new business software package.

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dBASE II uses English-like commands.

dBASE II uses a structured language to put you in full control of your data handling operations.

It has screen handling facilities for setting up input and output forms.

It has a built-in query facility, including multi-key and sub-field searches, so you can DISPLAY some or all of the data for any conditions you want to apply.

You can UPDATE, MODIFY and REPLACE entire databases or individual characters.

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You can do automatic calculations on fields,



records and entire databases with a few keystrokes, with accuracy to 10 places.

Change your data or your entire database structure without re-entering all your data.

And after you're finished, you can protect all that elegant code with our run-time compiler.

Expand your clientbase with dBASE II.

With dBASE II, you'll write programs a lot faster and a lot more efficiently. You'll be able to write more programs for more clients. Even take on the smaller jobs that were out of the economic question before. Those nice little foot-in-the-database assignments that grow into bigger and better bottom lines.

Your competitors know of this offer.

The price of dBASE II is \$700 but you can try it free for 30 days.

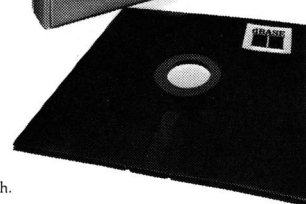
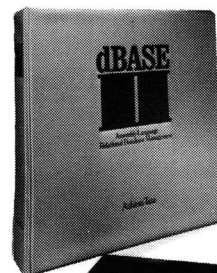
Call for our Dealer Plan and OEM run-time package prices, then take us up on our money-back guarantee. Send us your check and we'll send you a copy of dBASE II that you can exercise on your CP/M[®] system any way you want for 30 days.

Then send dBASE II back and we'll return all of your money, no questions asked.

During that 30 days, you can find out exactly how much dBASE II can save you, and how much more it lets you do.

But it's only fair to warn you: business programmers don't go back to BASIC's.

Ashton-Tate, 9929 Jefferson, Culver City, CA 90230. (213) 204-5570.



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Enhancement to the Transfer Utility

by James R. Gunkel

The newer versions of transfer (XFER) have some nice features for increasing its versatility. However, one detractor is that you have no clues, except visual (watch that tube!), for selections that do not verify (/V) or compare (/C). Selecting all files (*.*) with double sided and double density floppy disks could lead to a long and dull session, if you conscientiously watch each selected directory entry to ensure that it XFER's correctly. High speed copies are fine, but you should occasionally use a transfer type utility to put the disk files in good physical and logical order on the disk. Also, if you are moving files from one disk format to another you will have no choice but to use XFER (single density to double density for example).

A partial solution to the requirements to watch each transfer is to modify XFER so that it "rings your bell" if the XFER is not successful. That still means you have to stay in the same room and "listen." Once modified you could, if so inclined, lean back in the "easy" chair and "relax the eyelids"—NO SLEEPING THOUGH—you must note the offending file name if the bell sounds.

The modification is best done with the DEBUG program. For anyone acquainted with using DEBUG, this will be a "simple" modification. If you are not familiar with DEBUG, I would strongly suggest that you have a friend knowledgeable in this area make this modification.

Also nice, but not required is to change the program logo so that you know this is the modified program each time it runs. I changed the "XFER" in the heading line to read "BELL."

BEFORE — <XFER (Transfer) Version 02.05>

AFTER — <BELL (Transfer) Version 02.05>

Using DEBUG, load in the XFER.COM file.

- Note the last address after loading is complete
- <1E80H> with XFER version 2.05
- Use the query command (Q) to find "Compare failed"
- Q 100 1E80 'Compare failed'
- address was <0912H> in my case
- Note the location of the "f" in the "Failed"
- address was <091AH> in above example
- Using the substitute memory command (SM) change
- 6 characters from "failed" to read "07" 'fail' 07"
- SM 91A (command for substitute memory)
- 07 'fail' 07 <cr>
- Exit DEBUG and save this file with a different name (I used TFER).

Using DEBUG, load in the XFER.COM file.

About the Author

Lt. Col. Jim Gunkel is Program Manager for the United States Air Force working with simulation devices for the military. He has contributed articles in the past and will offer assistance to anyone needing it on this enhancement through I/O News.

Cromemco Opens 4th U.S. Regional Office

Cromemco's Western Regional Office, the fourth in a series of corporate branches opened in the U.S. over the past year, began operations in April.

Headed by Vern Fricano, Western Regional Director, the new office is located in Woodland Hills, California, a Los Angeles suburb in the West end of the San Fernando Valley.

Other regional offices opened by Cromemco over the past 12 months are in the Boston, Atlanta, and Chicago areas. The primary purpose of the regional offices is to provide support to dealers, both from technical and sales standpoints, so that they can better serve their customers via a direct—and more localized—pipeline to Cromemco.

The Western Regional Office's address is 5525 Oakdale Avenue, Suite 225, Woodland Hills, CA 91364. The telephone number is (213) 346-6690.

Continued from front page

32K Structured BASIC beats MBASIC 5.2 in Benchmark Test

The Cromemco 32K BASIC has a matrix initialization instruction and by replacing lines 50-70 with the instruction "50 MAT FLAG=1", the time is reduced to 1,182 seconds, or almost 5 minutes faster than the time given for MBASIC 5.2.

Needless to say, I was very pleased to see the speed advantage.

```

5  Imode
6  Noesc
10 Dim Flag(8191)
20 Print"10 ITERATIONS"
30   For M = 1 to 10
40     Count = 0
50     For Index = 0 To 8190
60       Flag(Index) = 1
70     Next Index
80     For Index = 0 To 8190
90       If Flag(Index) = 0 Then
100        Prime = Index + Index + 3
105        Rem—"PRINT PRIME
110        K = Index + Prime
120        While K <= 8190
130          Flag(K) = 0
140          K = K + Prime
150        Endwhile
160        Count = Count + 1
170        Next Index
180      Next M
190 Print Count,"PRIMES";
    Chr$(7)
200 End

```


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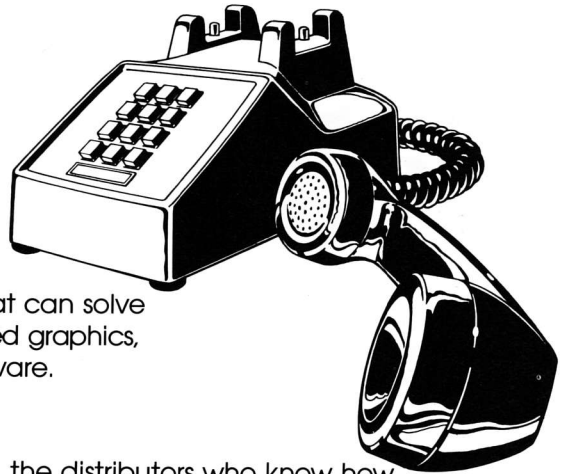
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Continued from front page

Direct I/O in "C" Using In-Line Assembly Code

dems, X-Y plotters, and the like with languages like BASIC and FORTRAN.

In the case of the "C" language, however, a different strategy was followed. Instead of providing the traditional extensions, a linkage mechanism to assembly language was provided. This is, like almost any decision, both a strength and a weakness. Its strength lies in the fact that ANY machine language function (like turning off the interrupts, for example), can be accommodated. Its weakness is that a programmer must become fluent in low-level assembly language in order to implement any extensions at all. In the case of "C", the PEEK and POKE functions are available through the use of pointers, but the traditional IN and OUT functions must be written by the user himself.

This article will present specific examples of "C" language functions which perform input and output with the I/O ports of a Z-80 microcomputer, and will present a simple way to link assembly code to "C" programs. (For the following, grab your copy of the Cromemco "C" manual.)

The in and out functions given can be invoked in any "C" function—including main()—by declaring them after the opening curly bracket of the function and then invoking them as required. Typical declarations are:

```
char in(),out(),port,byte;
```

In this example, in(port) returns as its value the byte that was read and out(port,byte) returns as its value the data byte that was output. The function in(port) can be used in any expression, and its value will be the byte currently at the input port designated by the value of the variable "port". Returning the value of the output byte makes it possible for the value to be output on the fly

prior to assigning it, testing it, etc. For example:

```
if(out(port,byte) == CR)out
(port,LF);
will "expand" CR to CR,LF in the out-
put stream to "port".
```

Although the procedure recommended in the "C" manual can be used to write such functions, the procedure outlined below is simpler in several ways. First, it is not necessary to declare the variables which communicate to the assembly code as globals, and they do not have to be defined in the assembly code. Second, it is not necessary to do any of the popping and pushing that is required in a free-standing assembler routine. These simplifications and the following specific examples will hopefully lower the ante for using all of the resources of your computer by means of the high level language "C".

Normally, parameters in "C" are passed on the stack, and they must be popped off in order to use them. The return address is also on the stack, of course, and if this item is not correctly dealt with, or if an incorrect number of parameters are popped, a malfunction will almost certainly result. The challenge of learning to do this correctly in assembly language is, to say the least, a trifle intimidating. Most programmers trying it for the first time should arrange for at least a free weekend with little else to bother them. However, since "C" automatically takes care of all the hassle when functions written in "C" call each other, it makes sense to let "C" do the complicated part, leaving only simple chores for the assembly code. In the following, a method for accomplishing this objective is presented.

The basic idea underlying these programs is that every "C" expression leaves its value behind in the Z-80 registers or in a globally defined location in memory. (This feature is documented in the Instruction Manual, but no examples of its utility are given.) In particular, anything that causes a pointer to be evaluated leaves its value in the HL register pair. Thus, to pass parameters to and from an assembly language segment, it is only necessary to group them all in an array (or in a structure if the data items are of dissimilar


```

/* File in.c */
/* this routine inputs a byte from a port */
/* usage: char = in(port-number); */
/* Note: The declaration in calling modules should be: char in(); */
in(local) /* "C" will automatically pop the port number off the stack and store it locally */
char local;
<
    &local; /* this evaluates the address of the local variable used for communication */
#control basm
    ld    c,(hl)    ;get port number
    in    a,(c)     ;get byte
    ld    (hl),a    ;return byte to same location
#control easm
return local; /* the local variable now contains the input byte */
>
/* File out.c */
/* this routine outputs a byte to a port */
/* usage: out(port,byte); */
/* Note: The declaration in calling modules should be: char out(); */
out(port,byte)
char port,byte;
<
    char outp[2];
    outp[0]=port;outp[1]=byte;
    outp;
/* an expression consisting solely of an identifier simply evaluates it. The "value" of an array name is its
address */
#control basm
    ld            c,(hl)    ;get port number
    inc           hl        ;move to next byte
    ld            a,(hl)    ;get byte to be output
    out           (c),a     ;output the byte
#control easm
return byte;
>

```

types), and evaluate the address of that array (or structure) immediately prior to invoking the assembly code. (If only a single parameter needs to be passed, then an array is not needed. The address of the variable containing it needs to be evaluated.) The assembly code can get at the values in the array via instructions such as `ld c,(hl)`, `inc hl`, etc., and can pass values back to "C" in the same array with instructions such as `ld (hl),c`, `dec hl`, etc.

In this approach, the assembly code is together with the "C" code as true in-line assembly code and not relegated to a separate place. And, since the stack is not used for passing values to the assembler code, debugging is not as complicated.

If these functions are compiled separately, you may not want to use the regular `cc.cmd` command. That command may try to link the output into an executable .COM or .BIN file, and this will generate some errors. These errors are not serious—they

merely indicate that there is no main program. Either ignore the errors, or edit the `cc.cmd` file to eliminate the invocation of the linker. In either case, valid .REL files will be produced, and these can be linked with other programs in two ways:

First approach:

```

link program,in,out,program
    .bin/n/e (for CROMIX)
link program,in,out,program
    .com/n/e (for CDOS)

```

Here we assume that `in.c` and `out.c` have both been separately compiled.

Second approach:

Use a library manager such as LIB.COM from Microsoft or RELIM.COM from Cromemco's overlay linker package to add the .REL files discussed above to the CLIB library.

For example:

```

RELIM    (CR)
* A = IN  (CR)
* A = OUT (CR)
* A = CLIB (CR)
* W = CLIB (CR)
* X

```

will do the job.

About the Author

Dr. Jerome Tiemann is a Physicist and Designer of Electronic Systems at the Corporate Research and Development Center of the General Electric Co. He is also a Computer Scientist from the days before there was such a term. At home, he uses a Cromemco Z2-H for all of his "word processing chores"—as well as for "doing homework". In this case, "homework" consists of working out ideas that occur in connection with his job, but which there isn't time to look into during the work day. It also consists of statistical analyses of data of interest to his wife, Dr. Adrian Tiemann, who is an applied Sociologist.

Jerry is a long time member of the Cromemco community and is a previous contributor to I/O News.



C-10 Developments Discussed

Several thousands of C-10s have been shipped by Cromemco since the beginning of this year, but we are only now beginning to receive feedback from this new level of users. The following letter best represents all the comments we have received to date, and we selected it for publication in the interests of all our new C-10 members:

Editor:

As a recent purchaser of a C-10 system, I would like to share a few thoughts with you. I am a neophyte in the world of computers, so my frame of reference is obviously limited.

I purchased the C-10 for two basic reasons. First, and foremost, I wanted a reliable and dependable system, and secondly, since my primary use of the system is for home personal use, I needed to find a moderately priced system. My research confirmed that the C-10 would meet both requirements.

During my brief experience with the C-10 I have discovered a few "bugs" which have been acknowledged by Cromemco, but which have not been corrected to date (i.e., no updated diskettes have been mailed).

The problems I found were:

- 1) In PlanMaster, any newly created define equation could not be carried over in a multiple page file.
- 2) In PlanMaster again, any attempt to save a multiple page file resulted in a mixed and inaccurate series of plansheets.
- 3) In WriteMaster, any file in excess of 24K will result in errors.

My dealer advised me that they are not in a position to correct my software, and had no information as to when I should receive updated diskettes.

I then telephoned Cromemco in Mountain View, and spoke with Caroline in Customer Service. She was courteous and honest in her response to my inquiries. She confirmed the above noted problems and stated that updated programs

should be distributed in about three weeks.

There was another problem I was having with PlanMaster, and I took the opportunity to explain it to Caroline. I have a number of PlanMaster files on one diskette, and to provide adequate space to expand a file, I transferred it to a newly formatted diskette. When I attempted to access the new diskette I found I could not do so. Caroline confirmed that Planmaster does not allow such a procedure. She explained that each time you create a new PlanMaster file diskette, you must also copy PlanMaster and accompanying programs totalling about 102K to the new diskette. This point is not mentioned in either the owner's manual, or the PlanMaster manual. It seems to me that such a restriction merits comment in a user manual, don't you agree?

As an aside, why is it so difficult to locate suppliers of dust covers for the C-10? A friend finally referred me to Compucover (in Florida) where I ordered a set of custom fitted vinyl covers for the two disk drives, keyboard, and the C-10 itself for \$19.95. Compucover's toll-free telephone number, for anyone interested, is (800) 874-6391. Allow about three weeks for delivery.

Being a new subscriber to I/O News I am looking forward to receiving my first issue, and am hopeful that you will pass along any updated information to we C-10 owners.

Yours truly,
Dan Frank
North Hollywood, California

Mr. Frank's letter was dated March 14, 1983, and he has since received the updates (Release 2) of the C-10 software disk which, he reports, have solved most of the problems listed.

he has also received the dust covers he ordered from Compucover, and he reports they are well made, reasonably priced, and were delivered within the time promised.

For the information of others interested in the progress of the C-10, we are reprinting the most recent Cromemco Software Update Service Notes.

Updates for the C-10—both in hardware and software—are a continuing project at Cromemco, with teams of R & D Specialists permanently assigned to ensure that the C-10 remains the best possible in personal computing.

Cromemco Software Update Service Note C10SP-1

CORRECTIONS AND ENHANCEMENTS

The C-10SP Software diskette supplied with the Cromemco C-10SP Personal Computer has been updated. Several software problems on the previous release have been corrected, and some software programs have been enhanced to provide new features. The updated programs are:

WriteMaster™ (word processing system)
MoneyMaster™ (stocks and bonds analysis system)
PlanMaster™ (financial planning system)
Copyfile (file copying utility)
Copydisk (disk copying utility)
Printer (printer selection utility)
Menu (menu handler)
CDOS (operating system)
WRITEMASTER (version 01.61, updated from 01.57)

The previous version of WriteMaster sometimes missed rapidly-typed keystrokes when automatic alignment was ON. This problem was more noticeable when justification was also ON. Keystrokes were also missed while the screen was being redisplayed after shifting to the right when the cursor moved past column 78. These problems have been corrected in version 01.61 of Writemaster.

The RECOVER TEXT function key can now be used to recover text overwritten by other material.

You can now align text containing

a word longer than the distance between the margins. Unless hyphenation is ON, such a word will be left intact on a line by itself.

With version 01.57 of WriteMaster, aligning text that contain underlined words sometimes caused underlining to appear in the margin of the line following the underlined word. This problem has been corrected in version 01.61.

The last line of text is no longer duplicated when part of the preceding line is deleted with the DELETE LINE key.

Lines that ended with a period one column to the left of the right margin were sometimes not justified correctly. This has been corrected.

WriteMaster now handles files larger than 24K without splitting or garbling them.

Function keys F5 (CONTROL-3) and F6 (CONTROL-SHIFT-3), though not labelled as such, can be used to move the cursor to the next and previous words in the file, respectively.

Function key F3 (CONTROL-2), though not labelled as such, may be used to move the cursor to the end of the text line. MONEYMASTER (version 1.11, updated from 1.09)

MoneyMaster no longer malfunctions when you enter a negative number for the selling price of a bond (menu item #3).

PLANMASTER (version c2.32, updated from c2.31)

You can now save a multipage PlanMaster file with different define files for each page. The define screen for the first page is no longer automatically read back into every page of a multipage file.

COPYFILE (version 01.27, updated from 01.25)

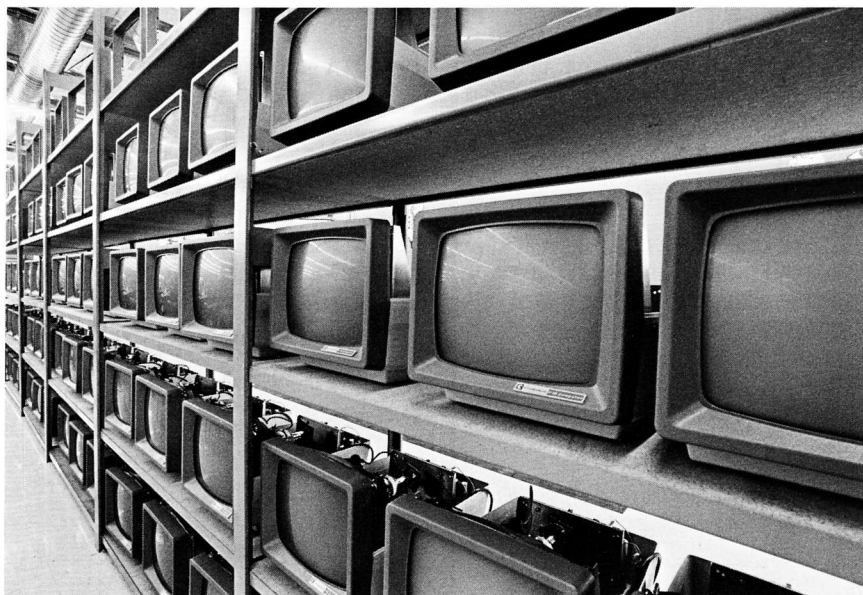
The handling of user entry errors has been improved.

The way you specify source and destination files has been made more flexible. You now have the following choices:

1. Type **copyfile** (or select C-10 menu item 13) and press the RETURN key. Then respond to the "from file:" and "to file:" prompts as explained in Chapter 10 of the C-10 manual.

2. Type **copyfile sourcefile to destinationfile**, as described in the C-10 manual.

3. Type **copyfile sourcefile desti-**



Racks of C-10s, in various stages of assembly, sit in silent testimony to the production efforts Cromemco has been expending to meet orders for this popular addition to its product line. (Photo courtesy of Cromemco, Inc.)

nationfile, omitting the word "to".

4. Type **copyfile destinationfile = sourcefile**. Note that the positions of the source file and destination file are reversed. This is a command format used on many personal computers.

5. Type **copyfile ambiguous-file-reference A:**. This command copies files with an ambiguous file reference, using only one disk drive.

COPYDISK (version 01.24, updated from 01.18)

CDOS (version c2.56, updated from c2.53)

A problem that caused the disk copying operation to stop before completion has been corrected.

Disk operations on diskettes produced with version 1.18 of COPYDISK were slower than operations on the C-10SP diskette shipped with the C-10. The disk formatting method used by COPYDISK has been modified to produce diskettes that can be accessed as quickly as the C-10SP stock diskettes.

MENU (version 00.05, updated from 00.04)

Overlapping files were occasionally created when users changed disks while the C-10 Main Menu was displayed. This has been corrected.

PRINTER (version 00.04, updated from 00.02)

The Printer Selection utility has been enhanced in several respects. In addition to allowing you to select

the type of printer to be used with the C-10, the Printer Selection Utility allows you to set the page size (page width, page length, and bottom margin).

Values for printer type and page size can be specified in either of two ways. You can use the interactive menus included in the Printer Selection utility, or you can include the appropriate values as part of the **printer** command, bypassing the interactive menus entirely.

Using the PRINTER Menus — When you give the **printer** command, the Printer Main menu is displayed. You can choose either the Select Printer Type menu or the Set Page Size menu by typing the appropriate number and pressing the RETURN key. You can press the ESCAPE key to leave a menu and restore all settings that were in effect before that menu was displayed.

Using the PRINTER Command Line — You can bypass the interactive menus altogether by entering the values for printer type and page size directly on the **printer** command line. The command line format is as follows:

```
printer printer-type page-width  
page-length bottom-margin
```

Printer-type is a number between 1 and 8, corresponding to the printer possibilities shown in the Set Printer Type menu. Page-width and page-length are numbers between 1 and

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C-10 Developments Discussed

255. Bottom-margin is a number between 0 and 254. If only the printer type is to be changed, the remaining setting values can be omitted from the command line. If the

printer type, page width, and page length are to be changed, the bottom margin value can be omitted. If only the page length is to be changed, values must be given for the printer type and page width, because the page length must be the third value following the word printer. If you make an error on the command line, an error message will appear and the appropriate menu will appear on the screen.

KNOWN PROBLEMS

The following problems still exist in this release of the C10SP Software diskette. They will all be corrected in a future release.

CDOS (version c2.56)

The C-10 CDOS Operating System cannot read single-density diskettes.

WRITEMASTER (version 01.61)

Subscripts and Superscripts — WriteMaster has commands for producing subscripts and superscripts. The Cromemco CLQ printer is not able to print subscript and superscript text.

Left Margin Function Key — The LEFT MARGIN function key (CONTROL-@) does not work properly. Until this problem is fixed, the left margin can be changed only by using the Set Format command or the Shift Margins command.

Disk Overflow Recovery — If you run out of disk space while using the WriteMaster program, the Disk Overflow Recovery function sometimes malfunctions. Until this problem is corrected, make sure the disk you are using has enough space to accommodate an increase in the size of your file. For maximum disk space, you should create a special WriteMaster diskette. First format a blank diskette and copy the system track onto it by using the first part of the Copydisk program. Exit from the Copydisk program after the system track has been copied but before the program begins copying all the files track by track. Then use Copyfile to copy just the following files onto the diskette.

CDOS.COM	WMAST161.HLP
MENU.COM	WMASTER.COM
MENU.DOC	WMASTER.TAB

By having only these C-10 files on the WriteMaster diskette, you in-

crease the amount of disk space available for your text files and reduce the likelihood of disk overflow. PLANMASTER (version c2.32)

Jump Command — The Jump command does not always jump to where you tell it. Instead, when jumping to a new page, PlanMaster jumps to the new page but apparently to the same cursor position as on the previous page, even if you directed it to a different position. Then when you enter data at the cursor position, the data appears in the position that you originally tried to jump to. If you enter a line label on the line where the cursor landed, it will print on that line, but if you Verify or ESCAPE Define ESCAPE, the label will move to the line that you originally tried to jump to.

If you jump to a new page and specify a new format and new data, PlanMaster ignores the new data instruction. If there is data on the previous page, PlanMaster will think that data is on the new page, but it will not display it. For example, if L1(C1,P1) = 111 and you jump to page two C1(L1) and type the "1" key, PlanMaster will print "1111" instead. This seems to be for the first input only.

Define Screen — If you type in definitions in the define screen, the last line to be typed must be followed by a RETURN. If you back up to edit before hitting the RETURN key after the last line, the last line will be inaccessible even while you are in the define screen.

Print — When printing all pages, if you specify that definitions not be printed and that 0.00 fields be printed as blanks, PlanMaster prints the definitions and all 0.00's on pages following page 1, despite your instructions.

Write Table — The Write command with the Table option saves your plansheet as a print file with the filename extension .prt (see Chapter 6 of the PlanMaster manual). If you use the Write Command with the Table option to create a print file of more than one page, PlanMaster sometimes skips page one, and puts only subsequent pages in the *.prt file. Also, definitions are sometimes printed when you indicate that you do not want them to be printed.

GD

Continued from page 13



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Improvement to Conditional for CDOS ".CMD" File

by Daniel J. Zachary

Upon execution of the program in Peter Ingerman's article, "Conditional for CDOS ".CMD" File" (Vol. 3, #1), I encountered some problems. If the command line which is to be executed (upon successful testing of the conditional statement) contains more than a command file name, the program will not execute properly because the default file control blocks are not set up as required by CDOS.

In the example Mr. Ingerman gives, "STAT/DT", there is only a command file (STAT) and switches. STAT does not expect anything in the file control blocks so it does not care that they are not set up properly.

But, if the command is, for example: " LIBMYLIB=ERASE, RE-NAME,STRING", CDOS expects that "MYLIB" be formatted at 05CHEX, "ERASE" be formatted at 06CH and "LIB.COM" must be formatted at some other location for use with the link CDOS system call. Since there are no file names in Mr. Ingerman's example, it does not matter that he uses 05CHEX for his command file control block. However, should there be any file names after the command file, this technique is rendered invalid under CDOS.

In finding these file names the program must be able to ignore the presence of any switches (/E, /V, etc.) and extraneous spaces and find the actual names which must be formatted.

Now the program has been reworked and, believe it or not, it should work under all circumstances which are valid in CDOS. In this version, the CDOS call has been used to format name to file control block.

This takes care of checking for the disk drive and shifting characters to upper case; therefore, these features were eliminated from the original program. The calls used in this revised program will run on CDOS version 2.35, and so the version test has been changed to this number. This program may also work on earlier versions, but, as yet, this remains untested.

Mr. Ingerman has an excellent idea in this conditional execute program — and, through conversation, has indicated an interest in these changes. My hope is that this revision will make the program completely flexible for any needs a programmer may have.

(Editor's Note: Copies of Daniel Zachary's program are available to members for the asking. Please write I/O News and ask for 'Zachary Adaptation of Ingerman Conditional'. Membership number should be included.)

About the Author:

Daniel J. Zachary is Chief Engineer of KCAM, in Glennallen, Alaska. He is a member of the IACU. **CD**

Continued from front page

20 Megabyte Disk Now Available

The HD-20 is designed for System Two or System Three users who want to add a hard disk drive to their system. The HD-20 includes both the 20-megabyte drive and the Cromemco WDI-II controller at a list price of \$3995.

Users who are currently using Cromemco's 5-megabyte disk drive who wish to upgrade to a 20-megabyte drive can also do so. List price of the 20-megabyte disk drive alone (Model No. H20R) is \$2495.

Reliability of the 20-megabyte drive should be superb. The drive is built into a solid metal casing which is internally shock-mounted from the external chassis. The disks rotate in a completely sealed chamber and are thus impervious to contamination from dust or par-

ticles. Cromemco, in fact, is so confident of the reliability of these drives that they have extended the normal 90-day warranty to a full year for the 20-megabyte drive.

The new hard disk drive is supported under both the CDOS and CROMIX operating systems. CDOS must be version 2.55 or higher. CROMIX must be version 11.16 or higher. CROMIX-D must be version 20.15 or higher. All users who subscribe to Cromemco's Software Update Service (SUDS) have already been sent these latest versions of software.

Where did the name "Winchester" come from anyway?

The 20-megabyte disk drive just introduced by Cromemco uses what is known as "Winchester" technology. This technology is characterized by rigid disk platters rotating in a completely sealed chamber with disk read/write heads that "fly" extremely close to the surface. Although most people know that Winchester technology was invented at IBM, various conflicting stories have appeared in the press with regard to how the name "Winchester" was derived.

We recently had a chance to talk with Dr. Kenneth Haughton who named the Winchester drive when he was at IBM in 1969. Dr. Haughton, it turns out, is an avid deer hunter and as such very familiar with the classic Winchester 30-30 rifle. When the first IBM prototype disk drive was built that used sealed-chamber technology it had two spindles, each with a 30-megabyte capacity. Ken dubbed this "30-30" drive the "Winchester," and the name has been used since then to describe this type of disk drive.

Dr. Haughton is now Dean of the School of Engineering at Santa Clara University. He first learned of Cromemco products on a trip to China, where he saw a large number of Cromemco systems installed in universities there.

The 20-megabyte disk is an exciting addition to the Cromemco product line and provides a good example of Cromemco's commitment to keep its users at the state of the art.

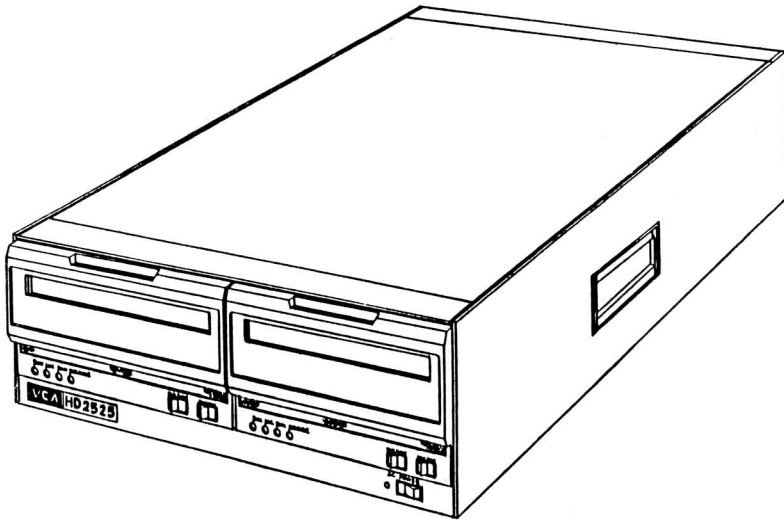
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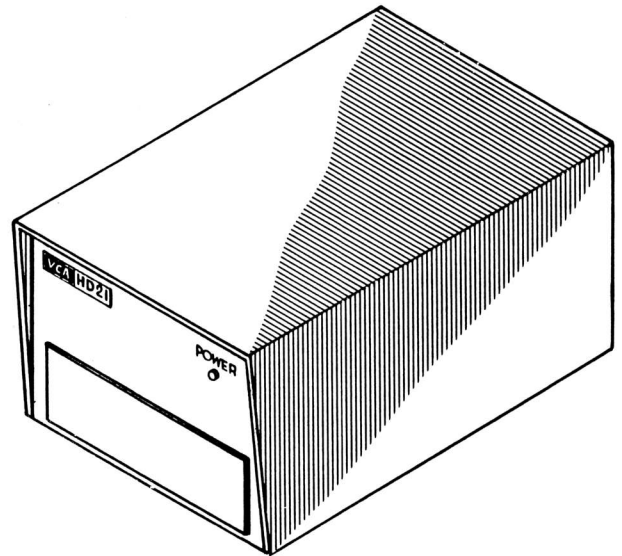


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Some Useful Patches

by Peter Zadrozny

This paper describes some patches we have used on our CROMIX system that have optimized its use.

First, we offer a patch that enables dBASEII to search for its overlays in a directory so one does not have to use a shell file to link and unlink them. In this specific case, we created a /b directory which contains these overlays. For version 2.01 of dBASEII, position 3EF3H must have a 02 (/b). This is also true for position 3F3AH. For version 2.3, the positions are 42F3H and 4314H. If you do not want to use /b directory, then 03 can be used for /c, and so on.

The second patch concerns WordStar. It has the same purpose as the earlier patch, to search for its overlays in a specific directory. The following patches for version 2.2 were made for searching in /b directory. They are:

Original code	Modified code
18AF LD A, C	18AF POP BC
18B0 POP BC	18B0 LD A, 02 ;Search in /b
18B1 RET NZ	
18B2 LD (DE), A	

Version 3.0 patches are the same but they are used for other memory positions. This version came to us with the WSXTSI overlay, and in order for it to search in /b, position 323H must have a 02. (I suppose that this position will also work on earlier versions.)

Original code	Modified code
18DE LD A, C	18DE POP BC
18DF POP BC	18DF LD A, 02 ;Search in /b
18E0 RET NZ	
18E1 LD (DE), A	

Our installation has three terminals, and one of them is a Televideo 950. It bothered us that we were not able to use the Screen Editor on it, so we devised some patches that would allow Screen Editor to work on this terminal. The patches were made on the control characters, which are located (starting with position 1B0H) in the following order:

Cromemco	Televideo	Function
Esc E	Esc *	Clear Screen
Esc H	^^	Home
Esc C	^1	Cursor right (->)
Esc A	^k	Cursor up
Esc K	Esc t	Clear to EOL
Esc J	Esc y	Clear to EOP
Esc F	Esc =	Address cursor
Esc Z	Esc .0	Cursor off (*)
Esc Z	Esc .2	Cursor on (*)
Esc 1	Esc G2	Blink on (*)
Esc m	Esc G0	Normal video (*)
Esc L	Esc E	Insert line
Esc M	Esc R	Delete line

Continued on page 39

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CD

Recent Product Releases From Cromemco

Two software releases and a new floppy disk controller card were released by Cromemco in March. There is a great deal of pent-up demand for both of the software releases, and both will prove a boon to developers of programs for Cromemco systems.

RPG-II (Report Program Generator) is one of the most widely-used languages for writing applications

on IBM's small business computer systems. The Panatec RPG-II series of test programs, which test RPG compilers, has been executed using Cromemco's RPG-II compiler and runtime library. The Cromemco software passed the test programs with the exception of those tests based on assumptions about EBCDIC, about IBM tape devices, or about

Continued on page 40

Current Versions of Cromemco Software

Package	Version	Date Master Created
Accounts Payable	02.65	01/11/82
Accounts Receivable	02.65	01/11/82
'C' Compiler	05.10	02/28/83*
Cromemco Diagnostic System	00.16	02/28/83*
Overlay Linker	01.16	11/12/81
CROMIX	11.16	03/08/83
DBMS/DBR	03.05	01/08/81
Dazzler Graphics	00.09	07/07/80
CDOS	02.56	03/08/83
Macro Assembler	03.08	01/27/82
16K Extended BASIC	05.70	04/27/81
COBOL Compiler	04.64	01/31/83*
FORTTRAN IV	03.42	09/15/81
RATFOR	01.05	09/15/81
General Ledger System	02.65	01/11/82
IOP Development System	03.00	10/31/82
Inventory System	02.65	01/11/82
KSAM	01.01	12/31/82
LISP	01.08	10/31/82
RBTE	01.06	11/13/81
Super Dazzler Graphics	02.03	01/31/83*
SlideMaster	02.03	11/16/81
SpellMaster	01.19	10/31/82
32K Structured BASIC	03.65	04/24/81
Word Processing System	06.00	01/08/81
WriteMaster	00.49	10/31/82
PlanMaster	02.10	08/31/82
MoneyMaster	00.00	12/31/82
CROMIX 68000	20.14	03/09/83
FORTTRAN '77	01.00	11/30/82
PASCAL 68000	01.00	11/30/82

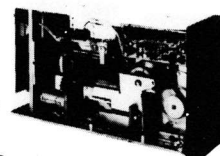
* Anticipated Release Date



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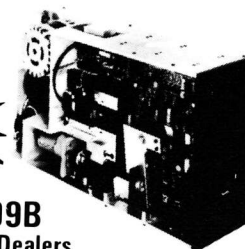


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Powerful Artificial Intelligence Language

LISP Now Available on 8-/16/32-bit Cromemco Systems

Cromemco's latest version of "LISP" has been released for use on its broad-based family of 8-, 16- and 32-bit computer systems.

Product marketing specialist Julie Geers said that the Cromemco LISP is designed for use in such data base applications as systems that understand natural language, systems for symbolic manipulation of mathematical expressions, intelligent controllers, robotics, computer-aided design and design automation.

Key to all of these applications is the use of LISP to develop what are called "expert systems" that emulate the way people think. Unlike algorithmic programs in conventional computers, expert systems do not operate according to specific, preprogrammed decision paths. Instead, they can weigh facts and make appropriate choices for each problem.

"Just now emerging from artificial intelligence laboratories, LISP is still only available commercially on relatively expensive minicomputers," said Geers. "Work is underway to move LISP to microcomputers, but most implementations so far are expensive." So-called LISP-dedicated computers now cost anywhere from \$30,000 to \$180,000.

Cromemco LISP, on the other hand, is only \$595 and can be used on any System One, System Two or System Three. Such configurations range in price from \$3995 to \$12,495.

Cromemco LISP, said Geers has virtual storage capability that allows infrequently used functions and symbols to be stored on disk, making possible much larger user programs.

In addition, this dialect of LISP incorporates many advanced features including:

- standard control constructs;
- complete string and character processing capabilities;
- both fixed and floating point arithmetic;
- comprehensive error-trapping capabilities;
- generalized I/O;
- the ability to interface to non-LISP procedures;
- a comprehensive library with over 150 utilities; and,
- MACRO facilities including both READ and general macros.

An extremely powerful feature of Cromemco LISP, according to Geers, is a table-driven, user-modifiable parser that allows the programmer to redefine the scanner and define a new LISP syntax.

"Cromemco LISP also contains a full complement of property list functions," said Geers, "which provide a powerful tool for constructing data bases."

Cromemco LISP is now available, with full documentation, on either 5¼" or 8" disks.



LOCAL USERS' GROUPS

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Recent Activities of Local Users' Groups:

Jo Ann Drake reports that, in a well received session, the Arizona Association of Cromemco Users visited the Graphic Design School. There, a System Two and Cromemco's SlideMaster software allowed Rock Cramer, graphic artist, to paint a picture using the computer. Said Cramer, "The computer won't make an artist from a non-artist—nor will it make an artist into a robot."

Cromemcohorts, the LA based users' group, was hosted by Rich Quinn at his Agoura, CA dealership, QUINTEC. Tips on hardware and software, along with a tour of his shop, were included. Networking among members via modems, a Cohorts Telephone Directory, and building their software library (which the Air Force Microcomputer Unit has requested a copy of) are some of the interests occupying this busy group.

MUG, the Microcomputer Users' Group in New Jersey, investigated various personal computers during their most recent meeting. Planned to be on hand were the CS-10SP, the Apple IIe and an IBM PC. Previous meeting topics have included CROMIX/UNIX password protection and modem communication via different micros.

Charles Perrella of NY, NY Users' Group reported that an introduction to the C-10 is on the agenda for the next meeting. Prior topics have included exploring the 256KZ card, and a dBASE II demo presented by Robert Schwartz.



Local Cromemco Users' Groups

Arizona Association of Cromemco Users

Contact: Jo Ann Drake, President
2207 West Eugie Avenue
Phoenix, AZ 85029
(602) 993-9589

Bay Area Cromemco Users & Programmers (BACUP)

Contact: Raymond Barglow or Alan Walworth
United Word & Data Processing
2345 Fulton Street
Berkeley, CA 94704
(415) 841-0708 or (415) 548-2692

Cromemcohorts

Contact: William M. Cannon, Ph.D.
Suite 1102, Santa Monica Medical Plaza
1260 Fifteenth Street
Santa Monica, CA 90404
(213) 454-0760

Cromemco Users' Group Holland (CUGH)

Contact: Joop Kohler, Secretary
P.O. Box 120
2910 AC Nieuwerkerk a/d IJssel
The Netherlands 01803 - 3300

Greater Dallas Area Users' Group

Contact: Lee Dixon
2629 Stemmons Freeway
Dallas, TX 75204
(214) 638-4477

Greater Detroit Area Users' Group

Contact: Frank D. Baber
P.O. Box 909
Warren, MI 48090
(313) 575-4607 or 759-2152

Cromemco Users' Group

Contact: Peter Norman
The University of Newcastle Upon Tyne
Department of Chemical Engineering
Merz Court, Claremont Road
Newcastle Upon Tyne NE1 7RU
England
Newcastle 28511, Ext. 3278
*Publishes Cromemco Users' Newsletter (CUG)

Insystems Pty. Ltd.*

Contact: Norman Rosenbaum
337 Moray Street
South Melbourne, Victoria
3205 Australia
(03) 690-2899, telex AA30458
*Publishes "Cromemco UPDATE"
a bi-monthly newsletter

Illinois Users' Group

Contact: Jim Knowles
P.O. Box 631
Elgin, IL 60120
(312) 695-7775

Indonesian Cromemco User's Group (ICUG)*

Contact: Zafir M.A. Pontoh
Computation Lab
Department of Regional &
City Planning
Bandung Institute of Technology
10 Ganesha
Bandung, Indonesia
(022) 82051 ext. 360
*Publishes "BERKALA ICUG,"
a monthly newsletter

Microcomputer Users' Group

Contact: Jim Lenz
1165 Barbara Drive
Cherry Hill, NJ 08003
(609) 428-6701

Netherlands Users' Group

Contact: R. van Wezel
Deurlloostraat 115 hs.
1075 HX Amsterdam
The Netherlands
(020) 761 549

Northwest Association of Cromemco Users (NWACU)

Contact: Jim Illman or Dale Schultz
403 S. Brandon
Seattle, WA 98108
(206) 763-2099

North Texas Cromemco Commercial Users' Group

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1161 Winterwood
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NY, NY Users' Group

Contact: Charles Perrella
7 West 45th Street
New York, NY 10036
(212) 354-6383



Complex Arithmetic With New FORTRAN Library

by Dr. Jean-Noel Aubrun

An extended version of FORLIB. REL distributed by N/C DATA fills a great need for Cromemco FORTRAN IV users who want to program algorithms involving complex numbers. Although complex numbers are used routinely in many fields of science and technology, most of the FORTRAN compilers available for micros do not support the COMPLEX type variables. The programmer usually works around this problem by re-writing every complex equation into two separate ordinary (real) ones, but this can be tedious and a significant source of error, particularly when converting from existing programs.

The alternative offered by the new Complex Extended Library (CEL), is a set of special functions which perform the four basic operations (+, -, *, /). For instance the complex equation:

$$a = b + cd \quad (1) \quad L \quad R \quad C$$

will be coded in FORTRAN as:

$$A = S\$(B,P\$(C,D)) \quad (2)$$

Translating from (1) to (2) requires a minimum amount of effort since the complex variables are explicitly called out. These variables form a special class in the program and they can only be handled via the four operation-functions or the usual complex FORTRAN functions (such as REAL, CONJG, CEXP, etc.) which are supplied in the CEL. The library also contains two non-standard functions: ARG (to obtain the argument) and RI\$ (to obtain real and imaginary parts at once).

The example below will give some idea of how this software can be used to create new programs or translate from existing ones. The sample problem is the computation of the impedance of a classical L, R, C circuit shown in Fig. 1.

The program on the left was written for a main-frame computer where the FORTRAN compiler supported complex arithmetic. The equivalent program was written for a Cromemco system using Cromemco FORTRAN IV and the CEL.

p/u program

In bench mark tests run by N/C DATA on a standard Cromemco Z-2D the following execution times were determined for the CEL operations:

Operation	Time (ms)
Sum	0.97
Product	1.7
Quotient	4.7

By comparison, the time for the usual double precision sum is .74ms and 2.5ms for the product.

The impact of the CEL on memory requirements is not significant, only 2K more than the standard FORLIB. REL, thus a total of 25K. This represents in fact an actual saving, even with moderate size programs, since the expliciting of complex equations into real pairs could more than double the size of the instruction area.

The CEL package is currently available in 5" and 8" diskettes with a comprehensive User's Guide, for a price of \$129.50. Further information can be obtained from N/C DATA, P.O. Box 933, Mountain View, CA 94042. Phone (415) 964-0121.

About the Author

Dr. Jean-Noel Aubrun received a Ph.D in Physics from the University of Paris, France in 1964. He also holds engineering degrees and has fifteen years of experience in the aerospace industry where he has made significant contributions in Dynamics and Control, large-scale integrated software and Computer Aided Design programs. He has over thirty publications in scientific journals and is currently consulting with N/C DATA in Mountain View, CA, for advanced software applications.

OLD PROGRAM STATEMENTS

```

COMPLEX Z,Z1,Z2,JOM
REAL*4 L
READ(3,300) R,L,C,F,
300 FORMAT(4E10.3)
JOM = CMPLX(0.,6.283*F)
Z1 = R + L*JOM

Z2 = 1./JOM*C

Z = Z1*Z2/(Z1+Z2)
RHO = CABS(Z)
CALL PHASE(Z,PHI)
WRITE(3,310) Z,RHO,PHI

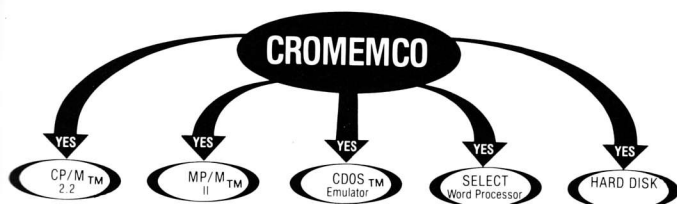
310 FORMAT(' REAL PART',1PE10.3/
1      ' IMAGINARY',E10.3/
2      ' IMPEDANCE',E10.3/
3      ' PHASE',E10.3)
STOP
END
```

- 1) User written subroutine
- 2) Library Function

NEW PROGRAM STATEMENTS

```

REAL*8 S$,P$,Q$,CMPLX
REAL*8 Z,Z1,Z2,JOM
same
same
same
same
Z1 = R
Z2 = L
Z1 = S$(Z1,P$(Z2,JOM))
Z2 = C
Z2 = Q$(1.D0,P$(Z2,JOM))
Z = Q$(P$(Z1,Z2),S$(Z1,Z2))
same
PHI = ARG(Z)*57.3
CALL RI$(Z,X,Y)
WRITE(3,310) X,Y,RHO,PHI
same
same
same
same
same
```



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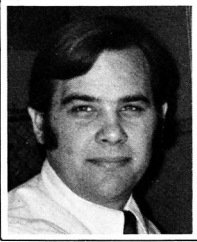
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tec·tips

TEC TIPS is a regular column aimed at providing hints for keeping systems up and running. It will not attempt to deal with specific engineering applications or non-standard configurations. TEC TIPS is edited by Richard Quinn, owner of QUINTEC, a Southern California Computer service firm.

HDD-5 Index Sensors

When the Cromemco System 1-H came out, it used the IMI (International Memories, Inc.) 5 megabyte drive. For some reason, occasionally it would develop CRC errors at random and cause those who had not backed up their systems a great deal of trouble. The problem was tracked (by Cromemco, not IMI) to the photo index sensor. The sensor was not mounted well and had a tendency to shift index pulses either late or early, causing miss reads or writes. In the case of a mis-read, there was no problem because the system would usually pick it up on a retry. But, if the problem caused a mis-write, the result could be a non-recoverable CRC error.

Cromemco has developed a comprehensive procedure for the adjustment of the index sensor. It is Service Note 023-9072, and was published 12/7/82. Careful adjustment by a qualified service tech really helps the problem.

Some systems still seemed sensitive to sensor problems — even with careful setup. Cromemco has since developed a software solution that works like a champ. In a new version of CROMIX (currently 11.16), the 5" hard disk driver takes an extra step if it cannot read a track, reading either early or late to see if it can find the information. This compensates for the shift in index pulses and solves the problem.

This points up a common misconception. There is a tendency to think of hardware problems as hardware-only problems, and vice versa with software problems. There is also a tendency to think of problems with Cromemco computers as purely Cromemco's fault. Remember though, that Cromemco uses sub-assemblies manufactured by others: disk drives — both hard and floppy — chips, monitors and terminals, printers, etc. In a sense, Cromemco takes on everyone else's problems when they

use these products. This makes the total job of support difficult at best, especially in consideration of vendors, who can be protective of their designs and reluctant to supply information on their systems.

Cromemco's fix for the index sensor error is a good example of innovative software solutions to hardware problems. It is also a good example of how software and hardware can work together for overall coherent system reliability.

New 5 Inch Hard Disk

Cromemco is now shipping systems with their new 20 megabyte IMI hard disk. This disk is the same physically as the 5 megabyte drive used in the past in both the CS-1H and the HDD-5, but turns out to be quite different in design and reliability. (It should be noted that it requires CDOS version 2.56 or greater, or CROMIX 11.16, to run properly.)

The new 20 megabyte disk solves the index sensor problem referred to above by use of an excellent magnetic sensor instead of the previously used photo optic unit. The new disk also differs from the 5 megabyte hard disk in that it is made of all aluminum construction rather than plastic. The electronics have been improved and it is much quieter. It is the drive I have been waiting for! 20 megs and rock solid — priced in a range where you can afford two, and use one to back the other if desired.

CP/M and CROMIX Compatibility

I often get involved in the installation of CP/M software on Cromemco systems where others have tried and failed. The main problems are not usually between CP/M and CROMIX, but compatibility problems in general between terminals, printers, or disk drives. While this column can't go into great detail, here are some examples.

We recently tried running a program used in building air condition-

ing designs. After several attempts, the user of the program decided it would not run under CROMIX and needed CP/M. When we tried to run the program on our system, it became apparent what was happening. The program was looking for its data files on drive "B". Running under CROMIX, the proper files were placed in the directory "/B", and the program ran without any other difficulties. This would have been a problem under any operating system. Check for obvious or simple problems! Don't make assumptions about software that is new to you without testing several options first.

One technique to use is to first test the software under CDOS version 2.52 or newer (current version is 2.56). This is a very CP/M like environment and serves as a preliminary test. We have also found that if it runs under CDOS, it will run under CROMIX if current versions (2.52 or newer CDOS, 2.56 newest; CROMIX 11.11 or newer, 11.16 newest) are used.

To date, I cannot think of a single piece of CP/M software that couldn't be run on Cromemco hardware. We have even developed a SUBMIT file "interceptor" to run some software that was very CP/M dependent, with good results. If the software is not going to run, it is usually very obvious. The system locks up or dies instantly or, most often, a "runaway program aborted", "illegal system call", or "call XX not supported" (where XX is the call number), message is given. The most common problems in running CP/M software, in order of frequency, are 1) disk drive designation is not done properly in the programs install utility or, the proper files are not placed in the proper directories (CROMIX) or disk drives (CDOS); 2) the CRT terminal requirements are not installed in the software, causing terminal lock up or malfunctioning which is assumed to be a program lock up; 3) the software is designed to be hardware dependent (especially true of communications software), and is not truly CP/M

tec-tips

compatible in that it controls hardware directly rather than through the operating system. The later item is sometimes necessary for performance and should be considered when buying the software.

One last point when considering CP/M software. Over the years CP/M has changed considerably. Programs written using early versions of CP/M will not necessarily run under new versions (2.2) of CP/M, and likewise version 3.0. It becomes very hard to remain "compatible" with a standard that does not even remain compatible with itself! To make things even worse, when Digital Research (the CP/M folks) came out with MP/M (their multi-user operating system), MP/M had great problems with its own CP/M compatibility. Many vendors had to change their software to run under MP/M or offer different versions for the different operating systems. Cromemco's CROMIX is better at running multi-user CP/M than Digital's own MP/M! The reason —

with a clever simulator (sim.bin), they are able to make normal CP/M run, without changes, as if it were running under a single user CP/M system but with the power and advantages of a multi-user system. In addition, you can run programs written for CROMIX without the simulator and pick up a great deal more power. If CROMIX had been around with good promotion when CP/M first showed up it could well have been the operating system of choice for both single and multi-user systems.

Why then, you ask, is CROMIX only used on Cromemco systems? If it's so great, why isn't it used on many systems? Two reasons: 1) it is dependent on Cromemco hardware designs which generally have more futuristic features built-in and, 2) other hardware manufacturers don't like to make hardware that is dependent on a competitor's software. To that end, the CP/M folks did it right, because they don't manufacture hardware, only software. Many hardware manufacturers viewed CP/M software as providing cheap software for their systems

without the expense of developing their own.

My guess is that the CP/M reign is over. M/PM was a big flop, and now they seem to have lost the race for a 16-bit operating system. It appears that the leader will be XENIX, a UNIX look-alike for the 16-bit world, which will probably use a CP/M simulator (like CROMIX) to use 8 bit software. We shall see.

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Using the C-10 as a CRT Terminal

The C-10 personal computer is designed to serve as a terminal to any Cromemco system, or for that matter, any computer. The terminal emulates the Cromemco 3102 and, in fact, replaces it at a much lower cost. It also has the additional advantage of becoming a personal computer when a disk drive is connected to it.

cludes automatic carriage returns used by CDOS and CROMIX to set baud rates.) In this CRT mode, the C-10 also establishes its own baud rate (a really nice feature if you want to move it from personal computer to multi-user to modem, etc.) It does this by going through all legal baud rates sending carriage returns until it receives one back, at which time it locks on and sends the message

interference. If you need a longer cable, or want to make a cable of your own, use the following pin connections:

C-10 "COUNTER" DB-9	System (TUART or FDC) DB-25	Function
pin 3	2	Data Transmit
pin 4	3	Data Receive
pin 5	7	Data Ground
Place a jumper from the C-10's DB-9 connector pin 2 to pin 7.		Data Car. Detect

When we first got our C-10, we wanted to hook it up to our CROMIX system. Customer support at Cromemco gave us the following information concerning the connections, which I shall pass on for the benefit of others who may need it.

If the disk drive is disconnected from the C-10, the unit comes up in the CRT mode as opposed to the C-10 personal computer mode. (This in-

"serial connection established" to the screen. (Time is not wasted flipping switches, but rather, the baud rate is set by software.)

The above is accomplished automatically, but now, a cable from the C-10 to the larger system is needed. The cable is available from Cromemco dealers as cable number CBL-CS, part number 519-0601. It is a good cable with shielding to prevent RF in-

After the cable has been installed, the C-10 can be connected to any Cromemco system and used as a 3102. Disconnect the cable, connect the disk drive, and you're back to a full feature, 64K personal computer that can be taken anywhere. (We have run our system on a Honda gas powered generator while camping to enjoy computing in the wild!)



bits & bytes, nibbles & tweaks

Scientific Software Wanted

Dr. William Biersdorf is searching for an analog signal averaging program. The program is to be usable on a System Two with dual density, double sided 5¼" disks to analyze bioelectric signals such as visual evoked responses.

Dr. Biersdorf suggests that the usual signal averaging program used on other computers utilizes an A/D converter, runs 1 to 4 channels (total 256-1024 addresses) and outputs to a digital recorder or through a D/A converter to an x-y recorder. In his case, the usual duration of the analog signal can range from 50 to 1000 milliseconds and is handled by a choice of several sweep times. Any information on such a program can be sent to:

William R. Biersdorf, Ph.D.
Ophthalmology 130B
James A. Haley Veterans' Hospital
13000 North 30th Street
Tampa, FL 33612

Announcing Indonesian Users' Group

Zafir M.A. Pontoh, of Bandung, Indonesia, has just informed us of the creation of ICUG (Indonesian Cromemco User's Group). The group will hold bi-yearly meetings in Sumatra and Java islands, and will maintain contact monthly through the publishing of a newsletter — BERKALA ICUG. (A short language course informs us that berkala is the Indonesian word for newsletter.) A complete address for the group can be found in this issue's Local Cromemco Users' Groups listing.

EDIT Discoveries

Two undocumented aspects of Cromemco's EDIT were noted by Peter Zilahy Ingerman, a Systems Consultant, while randomly experimenting with the program.

First, it was discovered that when "?" is entered, a list of edit commands is displayed on the screen. Upon examining this list, there appears a "M" command (also not mentioned). Entering a "-M" yields a prompt for a command line. There-

after, the command line which was entered can be re-executed by typing "M".

Anyone else know of any secrets to EDIT?

Graphic Library for Cromemco Systems

ProData MicroSystemer in Trondheim, Norway just announced the release of GPGS-F — General Purpose Graphic System — a library of FORTRAN subroutines handling wireline graphics in 2 and 3 dimensions. The device independent front-end has a dozen different drivers to accommodate everything from cheap plotters to advanced refresh screens.

Delivered with full source code, GPGS-F includes such features as device independency, several devices simultaneously, storing of picture parts on library, retransforming of picture parts, modeling and viewing in 2-D and 3-D. Graphic elements are defined in user's own coordinate system and are fully transformable. They may be lines, table of lines, curves, text, or circle arcs.

Also available is a subset of the complete package, named MICRO-GPGS-F, for 2-D plotting, routines for graph and histogram plotting, and routines for display of 3D surfaces as contour or hidden line plots. Several CAD-systems based on GPGS-F have been developed. For more precise information, contact Jarl Gronbech at:

ProData MicroSystemer A/S
P.O. Box 3240
7001 Trondheim
NORWAY

A:

A:SO

A:RD 100 1FFF 1

A:Q 100 1FFF E5 'Screen'

A:SM 1006

1006 E5 00

1007 53 .

A:SO

A:WD 100 1FFF 1

Help Needed

Steven C. Ingrassia sent in the following request for help:

"My company uses a Cromemco System Two, running CROMIX version 11.05. We hit the system pretty hard, having twelve qtty ports attached. We have a problem in that we often run out of process tables, long before we run out of memory. Having 12 qtty's uses 12 tables, process 1 uses another, and we only have 5 left. Many of our applications utilize a .cmd file, which calls a .com file, using 2 more tables."

Anyone who can suggest a solution can contact Mr. Ingrassia at:

Neochem Corporation
6565 W. Loop South
Bellaire, TX 77401
(713) 661-8335

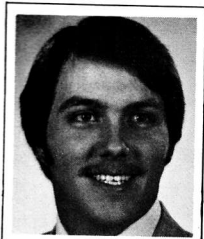
More on Recovering Erased Files

Jo Ann Drake's article, 'How to Recover Erased Disk Files,' (Vol. II, No. 6) has prompted much interest in the subject, which justifies further exploration. For example, it should be noted that the RDOS, versions 2.01 and higher, have the ability to recover erased floppy disks. For those who are not able to recover their erased files, the following is a simple fix. (Please note, though, that this method will not work with initialized disks.)

Insert your disk which contains the erased file, assuming that the erases file is 'Screen' in either drive A or B (whichever you choose). Prior to booting the system, enter the following to the RDOS prompt:

:Select Drive A if your disk is an 8 inch drive A.
Note that you have to enter 'A::;' if your drive is a 5 inch drive A.
:Set Track 0
:Begin with Sector 1 and read disk onto the memory space 100 to 1FFF.
:Find the erased Screen. RDOS will give you the location in memory of the erased file. (This example assumes that it is 1006.)
:Substitute memory 1006 (here RDOS will display the content of memory 1006 and wait for your input).
:Your input is 00
:Your input is '.'
:Set Track 0. (This is Very Important!)
:Write disk, beginning from Sector 1 of Track 0.

Continued on page 45



Soft Tips

SOFT TIPS is a regular column aimed at providing software oriented hints and ideas for non-programmers. Members are encouraged to send in tips that can help a user better use his/her system. SOFT TIPS is designed to put forth ideas that are general in nature. The column is edited by Norman Vadnais, Director of Cromemco Activities at Applied Research, Inc. (ARI), a Los Angeles Area dealer. Members contributions can be sent to SOFT TIPS, in care of I/O News.

A.TYPE LIB.DOC

This file lists the various ASMLIB program inputs and outputs.

ADEC	ASCII to Binary conversion
AHEX	Hex to Binary conversion
	Input: BC points to the left character of the string
	Output: BC points to the first character to the right of the string
	HL contains the binary value
BIND	Binary to Decimal, fill with character from A
BINDB	Binary to Decimal, space fill
BINDF	Binary to Decimal, zero fill
BINDS	Binary to Decimal, suppress leading zeros
	Input: A is fill character (BIND only)
	BC is actual binary number to be converted
	HL points to left byte of 6-byte string for result
BINH1	Binary to Hex, 1 digit
BINH2	Binary to Hex, 2 digits
	Input: A is value to be converted (low nibble, for BINH1)
	HL is left byte of string for result
BINH4	Binary to Hex, 4 digits
	Input: BC is actual binary number to be converted
	HL points to left byte of 4-byte string for result
FNAME	Make XFCB from FCB
	Input: A is 0 if given extension is to be used. Otherwise, A and BC are the three characters of the extension
	DE points to the XFCB
	HL points to the FCB
XDISK	Set up special XFCB from regular XFCB
	Input: A is "X", "Y", or "Z"
	DE points to the XFCB
ZNEW	Open new file per XFCB
	Input: DE points to the XFCB
	Output: New file created, extant files with the same name destroyed
ZOPN	Open old file per XFCB
	Input: DE points to the XFCB
ZCLOS	Close file per XFCB
	Input: DE points to the XFCB
PCHAR	Put a binary character to XFCB
	Input: C contains the character to be put out
	DE points to the XFCB
PUTC	Put an ASCII character to XFCB
	Input: C contains the character to be put out
	DE points to the XFCB
CGHAR	Get a character from an XFCB
	Input: DE points to the XFCB
	Output: A contains the character
ZIOER	File error message

Editor:

I enclose herewith a precis of the routines provided by Cromemco in ASMLIB.REL.

It would certainly be useful to me, and would perhaps be useful to others, if Cromemco would provide, and commit to maintaining, the status of the various registers on exit from each of these routines.

Obviously, in some cases, where a register is used as an output from a routine, it is clear that the register contents will be different from the value on input.

As an example, in the case of ADEC, and AHEX, the contents of register HL on exit is described; the same is not, unfortunately, done for the BIND set of routines, although it is my impression that HL points just after the string into which the value has been placed.

There is an implication that PNAME leaves the HL register undisturbed, but there is no statement to that effect.

It would seem to me reasonable that the documentation for a sub-routine should, as a matter of course, specify the values in the working registers on output if they differ from the values on input, and should preserve through the call those registers that are not germane to the action of the sub-routine.

32 K Classroom

32K Classroom is a regular column aimed at explaining some programming techniques using 32K Structured BASIC. The main emphasis is on "how to" with secondary emphasis on coding effectiveness. 32K Classroom is edited by Michael Turnage, President of Turnage & Turnage, Ltd., a software development company in Sunnymead, California.

Creating A File

Some of the most important functions of a program will create, store, and retrieve data on diskette. This data can be revised, reviewed, added to and deleted from through creative programming. This article will only cover three parts, the creating, storing, and retrieving of data on diskette. The next several articles will cover editing, adding, and deleting of data. While there are many approaches to file management, this article will only present this very simple method.

The program is broken into several small segments. The first segment is defining of the variables:

```
10 Close : Rem Closes any open file
20 Dim B$(3)
30 B$ = " " : Rem B$ = 3 blank spaces
40 Dim A$(46)
50 A$ = " " : Rem A$ = 46 blank spaces
60 clearscreen$ = chr$(27) + "E"
70 Flag = 0 : Rem flag for createf routine
```

In general the variables are set at the beginning of the program. Statements 10 through 60 are used to assign variables.

The menu is a segment of the program which is used to control the selections of the program. The selections are limited to create/store and retrieval.

```
80 *Menu
90 Print Clearscreen$
100 Print "Enter C to Create a File"
110 Print "Enter R to Retrieve a File"
120 Input "Enter F to Exit for Finished ", Sel$
130 If Sel$ = "C" or Sel$ = "c" then goto Createf
140 If Sel$ = "R" or Sel$ = "r" then goto Read
150 If Sel$ = "F" or Sel$ = "f" then goto Theend
160 Goto Menu
```

The menu is very simple at this time but will grow as additional segments are added. The createf selection will cause the computer instruction set to jump to the label Createf.

```
170 *Createf
180 Create "Sample.dat"
```

Statement 180 will create a file called Sample.dat on the diskette in the current disk drive. The error message #137 will be received if the file sample.dat is already created on the diskette. If this error is received, erase the file named sample.dat per the following example:

Example: >>Erase "Sample.dat"

Then rerun the program to create the file. The Create file routine will automatically start adding

records to the file starting at record number one after creating a file.

```
200 *Addrecord
210 If Flag>1 then Goto Begin
220 B = 0
230 Print
240 *Begin
250 Print : Print "Enter Your Data Record #
";B + 1
260 Input "Name : ", A$(0,20)
270 Input "S/S : ", A$(21,40)
280 Input "Date : ", A$(41,46)
```

This is the data collection statement which requests input into the string variables. This information is only contained in memory and will be lost if power to the computer is removed.

```
290 Open\2,46\ "Sample.dat"
300 Put\2,B\A$
310 Close\2\
320 Print:Print "Enter End to Exit: ":Print:Print
330 Input "Press Return To Continue : ", C$
340 If C$(0,2) = "End" or C$(0,2) = "END" or
C$(0,2) = "end" then Goto Exit
350 A$ = " " : Rem A$ = 46 Blank spaces
360 B = B + 1
370 Goto Begin
```

The data is stored on diskette using statements 290 through 370. Then the program is halted to allow you to make a selection, to add additional records or exit the program. If you depress continue the program will pass to statement 300 which will jump to the label Begin. Statement 180 has two statements on one line. The expression b = b + 1 is used to increase the record counter. Notice the storing of data is handled by using the value of B as a record number.

```
380 *Exit
390 B$ = Str$(B)
400 Open\4,2\ "Sample.dat"
410 Put\4,5\B$
420 Close\4\
430 Goto Menu
```

This set of statements will store the value of B or the record number plus one on diskette. The major difference is the channel number has been changed to four (4). After storing the records the program returns to the menu.

The retrieval selection will cause the program instruction set to jump to the label named read. But before the records can be read the number of records must be known. Remember this information is stored on diskette on channel four (4).

```
440 $Readf
450 B$ = " " : Rem Clears B$
460 Open\4,2\ "Sample.dat"
470 Get\4,5\B$
480 Close\4\
```

Continued on page 45

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EPROM LTDA.

Antonio Bellet 226, #704
Casilla 16494, Correo 9
Santiago
Chile

740910/Telex: 332-340436 PBVTR KU

Eprom is a consulting firm which specializes in software development for business applications and process control in industries. Computer marketing of the company is limited to CROMEMCO systems.

Key Personnel: Jorge Bellet, Sr. Executive
Eliana Ferrada, Administrator
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Major Market Area: Most of Chile. Local service is now being offered in Santiago, Valparaiso, Concepcion and Africa.

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1067 Buenos Aires
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30-4498/Telex: 390-17341 ITTEL-A RMMM

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Continued next page

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Major Market Area: Primarily West Germany

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U.L. Permadi, System design

Major Market Area: Stores in Jakarta, Bandung, Surabaya, and Medan, Indonesia.

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Major Market Area: China and Hong Kong

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Taipei, Taiwan

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Key Personnel: Hurdy J.W. Su, Executive Vice President
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Major Market Area: Taiwan, Republic of China

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Continued on next page

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Major Market Area: National Hardware and Software sales and support.



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Cromemco users now have a unique new source for software. Once per month, SoftTec sends subscribers a floppy disk loaded with Cromemco-compatible software, including source code, object code, and full documentation. These programs are written in a wide range of languages, including FORTRAN, COBOL, SBASIC, ASSEMBLER, and LISP. The programs are designed to run under the Cromemco CDOS¹ and Cromix² operating systems.

Each of the twelve monthly volumes features a mixture of programs for various applications. Throughout the year some theme editions are also included, such as dBASE II³ applications, 'C' utilities, and Cromix command procedures. An important feature of this service is the inclusion of both source code and executable object code. A user can run the utilities and programs without owning a special compiler, and the program source code is included for all subscribers to see and modify!

SoftTec's new service is available on both 5 and 8-inch floppy disks. Each month's disk contains at least twelve programs. The yearly cost of the service is \$100.00 for 5-inch disks and \$125.00 for 8-inch disks. The fee covers all twelve monthly disks, giving the user a total of at least 150 different programs.

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Continued from page 19

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IBM disk or sector structures. Test programs based on those assumptions will not execute without first being changed for similar assumptions on Cromemco systems (e.g., ASCII must be used rather than EBCDIC).

Utilities are provided with Cromemco's RPG-II which allow the movement of files from IBM-3740 format, 8" diskettes to Cromemco format disks of all types, or vice versa, and to translate EBCDIC files into ASCII files.

The Cromemco Z-80 based RPG-II package is designed for use under the CROMIX operating system, and is available on 5" or 8" diskettes.

Another long-awaited release is the **CROMIX Driver Software**, a package designed to be used with either Z-80 CROMIX or 68000 CROMIX-D. This software allows systems integrators and other sophisticated users to develop new character I/O drivers for use with the CROMIX operating system, and opens up a whole new vista of uses for Cromemco systems.

The drivers may reside in either the main system, or in the IOP or other C-Bus devices. For example, utilities and subroutines are provided that allow Character Buffering, Host Answering, and C-Bus Process Control for adding a new IOP Character Device Driver. Documentation supplied with the CROMIX Driver Software outlines how to add new Character Device Drivers.

The package is available on either 5" or 8" diskettes.

The new floppy disk controller card, the **64FDC**, was designed for use with the Tandon Slimline 8-inch drives used in the System 3-A, and offers several added benefits over the 16FDC despite its reduced parts count.

The 64FDC provides a complete system for floppy disk operation, and includes a 512 millisecond real-time clock for use with the CROMIX real-time multi-user, multi-tasking operating system. The data recovery circuit uses a patented locked loop to optimize performance for each size and density diskette. The 64FDC also provides an upgrade path for using higher data rates anticipated in future generation five-inch floppy disk drives.

DD

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- ✧ Analog Phase Locked Loop Data Separator. The PLL is used in all modes, including single density, on both 5" and 8" disks.
- ✧ Easy Installation. The main board plugs into the 1771 socket on the 4FDC. One other 14 pin chip on the 4FDC is removed and a header plugged into the socket. If 8" drives are in use then one wire must be soldered to the 4FDC from the FDCX4.

Still skeptical? The FDCX4 is sold with a special 15 day money-back guarantee. This means you can use it and see for yourself.

Note: In order to operate in double density the FDCX4 requires CDOS V2.36 or later, and any CP/M used must be capable of double density operation with the Cromemco 16FDC.

The price of the FDCX4 is \$229.95 including shipping. C.O.D. orders are accepted only for deliveries within the USA. Export orders please include payment in US funds. Calif. residents include 6% sales tax. To order or for more information write or call:

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GETEDIT — A Powerful Machine Code Terminal I/O Routine for CP/M & CDOS Software Writers

by John Line

Have you ever thought how frustrating it is for someone, using your software, to have typed in 30 characters of data, only to realize they've misspelled the first word? If they've pressed return, it can be put down to experience; but if not, then read on!

In this situation, it would be nice for the user to be working on a big mainframe, with a terminal operating in block transmission mode. But

no, they're in conversational mode, and the closest their terminal will ever get to full editing, is wishing it could! So it's count to 10, press rub 26 times, and retype everything just rubbed out. Oh no, not again...

What creates this problem is that your software, written for CP/M, cannot make any hardware assumptions with regard to the user's terminal. You probably used the input

buffered line system call and processed the data, after it had all been keyed in! What can be done to prevent the user from keying in "ABC", when attempting to input a number?

Now there is a simple solution in the form of a Z80 assembler routine written by Gem Software. If you write assembler software, for either CDOS or CP/M, the terminal only is required to have cursor positioning capability for you to easily build into your software full data entry, protection, editing and validation abilities.

Getedit incorporates many data editing functions. These functions are performed by means of control codes, as follows:

CONTROL CODE	FUNCTION
A	Convert text to upper case. (Alpha/Keyed Alpha)
B	Move cursor to beginning of field.
D	Delete field. (Date — Zeroes field)
E	Move cursor to end of data.
H (left cursor)	Move cursor one position to the left. (Date — Delimiters automatically skipped)
I (tab)	Move cursor to next word of data. (Integer, Decimal — Moves cursor to the beginning of field) Date & Financial
J (down cursor)	Delete character under the cursor. (Decimal — Will not delete an exponent "E", Date — Replaces digit with a zero)
K (up cursor)	Insert character at cursor position. (Alpha — Inserts a blank, Keyed Alpha — Inserts a blank, Integer — Inserts a zero, Decimal — Inserts a zero, but not between an exponent "E" and a minus sign, Date — Is not allowed, Financial — Inserts a zero)
L (right cursor)	Move cursor one position to the right.
M (return)	Signifies that data-entry/editing is complete. (Alpha — Data returned to calling program, Keyed Alpha — Data may not be keyed on a blank, Data is rotated before return, Integer — Data converted into 2S complement 2 byte binary form and validated for range before return, Decimal — Data converted to BCD format and range validated before return, Date — Data is validated and returned in a two byte "YYMMDD" encoded form, Financial — Data is validated and returned as a 6 byte BCD number)
T	Truncate the data from the cursor onwards. (Decimal — Will not truncate immediately after an exponent "E", Date — Data from cursor onwards will be changed to zeroes)
Z	Convert data to lower case. (Alpha/Keyed Alpha)

Integer, decimal, financial fields may be further edited, by use of the following ASCII characters:

Character	Function
Blank	Produces 000 starting at cursor position
Date fields may also be edited, by use of : —	

Character	Function
D or d	Move cursor to second "Day" column
M or m	Move cursor to first "Month" column.
T or t	If running under CDOS, set field to system date. If under CP/M, set field to zeroes.
Y or y	Move cursor to first "Year" column.

The Getedit routine will handle six different types of data fields: 1) Alpha, 2) Keyed Alpha, 3) Integer, 4) Decimal, 5) Date, 6) Financial.

ALPHA FIELDS can contain any printable ASCII characters.

KEYED ALPHA differs from Alpha in just one respect—the data keyed in will be returned by the Getedit routine in a "rotated" form.

(e.g. Instead of keying in "BLOGGS, FRED Mr." so that the record gets filed under "B", you key in "MR. FRED BLOGGS", then, using the cursor control keys, or control codes, you position the cursor on the "B" of "BLOGGS". When you press return and control is returned to your program, the data has been "rotated" such that it is now "BLOGGSMR. FRED". The user keys what he wants to see, then Getedit rotates it.)

INTEGER allows you to key in a "... and the numbers 0 to 9. Getedit returns a two byte 2's complement number. Getedit will not return control to your program until a valid number has been entered. Valid integer numbers are in the range -32768 to +32767.

DECIMAL will accept floating point numbers. "E" notation is supported. Data is returned as a BCD number in the range + / - 9.9E - 65 to + / - 9.9E62.

DATE will allow any valid date in DD/MM/YY format, implementing many advanced features.

(e.g. 4th July, 1982 may be entered with only five keystrokes. If you are running under CDOS, and the system date is set, today's date can be entered with only two keystrokes.)

FINANCIAL will accept numeric quantities, to two decimal places, in the range + / - 7999999999.99 and is designed for handling money.

Data Entry may be aborted, by the user, at any time by use of the escape key. If data entry is completed normally, when control is returned to your program, the accumulator and the return area will contain hex 00. Should the user abort data entry, Getedit will return control to your program immediately, having placed an escape character (hex 1B) in the accumulator and the return area. It is then up to your software to process this condition.

The Getedit routine is called with registers containing the addresses of three parameter areas. The first

parameter contains a prompt string, which is to be displayed for the field, and the screen position at which to place this prompt. The second area specifies the type of data field, a default value for the field and the maximum length of the field. The third area contains one of two values. An ASCII 'D' tells Getedit to display the prompt and data and then return to your program. An ASCII 'G' tells Getedit to display both fields and then allows the user to perform data entry and editing. In this way, Getedit lets you display a full screen of data, then edit each field in turn.

Getedit provides full software field protection. The cursor will not be allowed to move beyond the bounds of the field, nor can the cursor be moved to the unused portion of the field.

An example:

← PROMPT → X ← FIELD →

ENTER CLIENT NAME : MR. FRED
BLOGGS

← A → X ← B →

A. Cursor may be moved freely within this area. This area may never extend beyond the total field area.

B. Cursor may only move into this area if data is keyed after the "S".

Getedit also has entry points for the output processing of Getedit produced fields, as follows:

Keyed data will be returned "unkeyed". (e.g. "BLOGGSFRED MR." will be returned as "MR. FRED BLOGGS".)

Integer data, in 2 byte 2S complement form, will be returned in ASCII form.

Decimal data, BCD numbers, will be returned as an ASCII string.

The string will contain a normalised mantissa and an exponent value.

Date fields, produced by Getedit, will be returned as ASCII in the form, DDXMMXY, where "X" is a software supplied delimiter.

Financial fields, 6 byte BCD numbers, will be returned in ASCII form. The returned value will always end with two decimal digits. (i.e. 67.00 or -1.20 or 423.87.)

Entry points exist for the addition and subtraction of Getedit produced financial fields. Two fields must be passed as parameters and Getedit will place the sum/difference in the first field.

The Getedit routine occupies just over 3K of storage and may be linked to any object code module. The only restraint is that the terminal your software is to run on must have cursor addressing.

Think of how much time Getedit can save you. Incorporate Getedit into your software and your programs will be much more user-friendly, also you will be able to spend time in problem solving, not in terminal I/O.

About the Author

John Line was awarded his B.Sc. degree in Mechanical Engineering at Hatfield Polytechnic. He entered computing 10 years ago, and has been working with micros for three years. Experienced in the Aerospace Design industry, he is now Managing Director of GEM Software. Queries regarding Getedit can be directed to Mr. Line at:

GEM Software Ltd.
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Continued from page 26

bits & bytes, nibbles & tweaks

Now, after booting the system,
the erased file will appear.

I hope this helps.

Sincerely,
Antoine Dahdah
Caracas, Venezuela

D.C. Users Unite!

Rick Steinheiser of the Office of the Chief of Naval Operations in Washington, DC, would like to hear from other users in his area for the purposes of learning more about using their Cromemco systems. Sort of an informal network of Cromemco users in the Greater D.C. area. Who knows? This could become the nucleus for a new users' group. Rick can be contacted at (202) 694-4970 or 694-4983.

Houston Area C-10 Users' Group?

More and more members are acquiring the C-10, which has spurred a steady increase in requests for information on this new system. Those in the Houston area can have a real advantage in better utilizing their new C-10 by contacting Hong Van Luu, a member who desires to form a C-10 user's group in Texas. Similarly interested users can contact Mr. Luu at:

Baylor College of Medicine
The Methodist Hospital, A-701
Houston, TX 77030
(713) 790-4614

32K Classroom

The number of records in the file is stored in the string variable B\$. But it must be translated to a variable to be used in this program. The following statements translate the variable.

```
490 B = 0 : Rem zero B first
500 B = val(B$)
```

Now the file can be opened and the data stored in each record can be read and printed.

```
510 A$ = " " : Rem 46 Blank spaces
520 Open\2,46\Sample.dat
530 For I = 1 to B
540 Get\2,I\A$
550 Print"Record #";I + 1
560 Print"Name : ";A$(0,20)
570 Print"S/S : ";A$(21,40)
580 Print"Date : ";A$(41,46)
590 Print
600 A$ = " " : Rem 46 Blank spaces
610 Input" Press Return to Continue: ",Who$
620 Next I
630 Goto Menu
```

The entry of F will cause the program to jump to the exit routine.

```
640 *Theend
650 Close
660 End
```

This completes the program segments for this issue. The next article will add to this program with new segments.

□□

□□

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(indicate level)

(indicate branch)

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the following Packages:

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Describe Your Present System:

(use brands and model numbers)

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Memory: _____

I/O: _____

Disk: _____

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Other: _____

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What Types of Software Would You Like to know more about?

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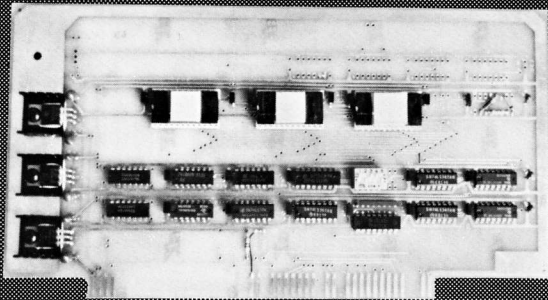
Subject Matter: _____

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- d. Instruction Set includes:
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manipulations

-32-bit integer arithmetic, stack manipulations

-32-bit floating point arithmetic, trig, log, X**Y, stack manipulations, etc.

2) Software: MAP-48, a floating point library for use with FORTRAN IV

- Library allows parallel operations of host processor and Micro Array Processor
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- Programs are typically SMALLER when linked with the MAP-48 library.
- A library with no error-trapping is available on special request (where speed and/or memory size are critical).

The following arithmetic routines are contained in the library:

	Addition	
\$AY	Integer*4	Integer
\$A1	Integer*4	Integer*4
\$AA	Real	Integer
\$AE	Real	Integer*4
\$AB	Real	Real
\$AQ	Double	Integer
	Exponentiation	
\$E9	Integer*4	Integer
\$EA	Real	Integer
\$EB	Real	Real
	Multiplication	
\$M9	Integer	Integer
\$MY	Integer*4	Integer
\$M1	Integer*4	Integer*4
\$MA	Real	Integer
\$ME	Real	Integer*4
\$MB	Real	Real
	Division	
\$D9	Integer	Integer
\$DY	Integer*4	Integer
\$D1	Integer*4	Integer*4
\$DA	Real	Integer
\$DE	Real	Integer*4
\$DB	Real	Real
	Subtraction	
\$SY	Integer*4	Integer
\$S1	Integer*4	Integer*4
\$SA	Real	Integer
\$SE	Real	Integer*4
\$SB	Real	Real

Additional Library routines are provided for converting between value types.

The Systems Atlanta Micro Array Processor is available exclusively from:

Royal Data, Inc.
2199 Garden Street
P.O. Box 2745
Titusville, FL 32780
(305) 267-1960 or 894-7641

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